2009

Do users go with the new workflow? from user participation to quality of work during wfm deployment

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DO USERS GO WITH THE NEW WORKFLOW? FROM USER PARTICIPATION TO QUALITY OF WORK DURING WFM DEPLOYMENT

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Abstract

What determines the involvement of users to 'go with the new workflow' in the case of workflow management (WFM) deployment, and how is this related to their perceived quality of work? This key question is addressed in this paper. Customized for our empirical case context – a large Dutch social insurance organization that recently deployed a WFM system – we developed a conceptual model based on the models and concepts of DeLone & McLean, Hartwick & Barki, and Kappelman & McLean. Our model subsequently relates user participation, user satisfaction and quality of work, shortly after WFM deployment. The expected relations are tested by survey data collected from 143 end-users. Results of correlation and regression analysis show that (1) the degree of influence is a key determinant for the perceived quality of the system, (2) perceived system quality is a main driver for user satisfaction, and (3) user satisfaction is a main determinant of the users' perceived quality of work.

Keywords: user participation, user satisfaction, workflow management systems, quality of work, public service organizations.

1 INTRODUCTION

Workflow management (WFM) and WFM systems have been around for a long time (cf. Kobielus 1997, Jablonski 1995, Hollingsworth 1994), but its adoption and deployment remains a relevant topic. An editorial article of Information & Management suggests that WFM has enjoyed regular attention over the years 1998 to 2005 with mostly three articles published per year (Palvia et al., 2007). Most recently, WFM has been extended to the broader concept of Business Process Management (cf. Smith and Fingar 2004, Weske et al. 2004).

The general premise of applying workflow management, is that the coordination of work can become easier, a higher quality of services is delivered, the work is executed more efficiently, and the process becomes more flexible (Reijers et al. 2003). Despite the successes (Fischer 2007), there are also many questions about the implementation of workflow management. Most of the problems appear to be of an organizational nature, rather than technical. Moore (2002) found that excessive activity automation and poor design of work assignment strategies are critical in workflow projects. In an influential study on the effects of workflow systems on organizations, Küng (2000) concludes that workflow design should actually be extended towards job design *and* organizational design. Most critically, employees outside the IT department should play an active role from the beginning of a workflow project. This essentially implies that user participation and user involvement in WFM deployment will improve its success.

Not much empirical research has been conducted on the success of WFM systems applying survey research among users. There seems to be white spot with regard to the organizational benefits from WFM deployment in terms of the effects of WFM on the quality of work of end-users. This is

remarkable given the extensive lines of information systems (IS) and information technology (IT) research on the perceived usefulness and perceived ease of use of IS/IT (cf. Markus and Keil 1994, Venkatesh et al. 2003, Konradt et al. 2006, Sabherwal et al. 2006), and the line of social science research on job changes and quality of work in relation to technology and ICT (Zuboff 1984, Benders 1993, Mullarkey et al. 1997, Andries et al. 2002). Apparently, these two lines of research have developed quite separately from each other.

This paper aims to contribute to the different research problems and issues addressed above. By approaching the deployment and effects of WFM in organizations from both an IS/IT and social science perspective, we go beyond the studies that analyse WFM either from a technical, organizational or a job perspective. The lack of empirical research drives our objective to develop and test explicit hypothesis about the relationship between WFM deployment and the users' quality of work. We firstly do this by building upon the research on upgrading and downgrading of skills and jobs in relation to IS/IT (cf. Grint and Woolgar 1997, De Witte and Steijn 2000, Bresnahan et al. 2002). Secondly, we develop testable hypothesis on the intermediating role of user participation for WFM success and quality of work. All hypotheses are part of an integrative conceptual model that provides an answer to the central question how WFM deployment effects the perceived quality of work of users. A key element of this paper is the data by which our model and hypothesis are tested. Contrary to the 'common' structure of most papers, we start by describing the case context of an empirical study on a large Dutch social insurance organization that recently deployed a new WFM system. The the conceptual model and its underlying expectations are tested by data collected from a survey among 143 end-users of the WFM system. After a discussion of the results the paper concludes with some recommendations for further research.

2 THE CONTEXT: WFM DEPLOYMENT AT A LARGE DUTCH SOCIAL INSURANCE ORGANIZATION

The empirical research for this paper is based on a case study and survey within a large Dutch organization for the execution of employee (social) insurances. Since its foundation in 2002, as a result of a merger of five public organizations, the formal mission of this organization is "to stimulate people to work, and if work is impossible to provide a temporary income". The organization is an independent policy agency that resorts under the Dutch Ministry of Social Affairs. It is a large administrative organization that has a national task to execute several social security laws. The organization controls all administrative and financial processes to execute these laws, and is dedicated to control misuse and fraud. A second task is to realize the reintegration of (partly) unemployed and disabled employees. For this task, it collaborates with private health companies. The organization has 17,292 employees amounting to 14,563 Full Time Equivalents (FTEs) in 2007. The research took place within the so-called Social Medical Function (SMF) domain. The focus of this domain is to examine the medical- and work capabilities and to judge the claims of the clients within the scope of the national laws. Within the SMF-domain the number FTEs in 2007 is 6,359.

In 2005, a project was started to support the front office to integrate existing applications. As part of that project a WMF system was developed. This WFM system was primarily aimed to streamline the core administrative processes of the social security laws within the SMF organization and improve its quality in terms of compliance with rules and procedures that are mostly of a legal kind. The WFM system consisted of a standard software package with custom-build components to support the transition of information and tasks from one 'resource' to another. A resource can be a person (i.e. an employee) or a system (i.e. an application). Besides achieving more efficiency and higher quality of services, the goal of the WFM project was to reach uniformity in case handling. To support this, the concept of teamwork was introduced. Teams were created by joining five different types of employees namely team-support employees, process support employees, work/job consultants, insurance medical doctors, and sometimes medical assistants. To ensure that the composition of the team fitted with the system, the size of a team was flexible. It was intended that a proper composition of the team will increase the (user) performance of the new WFM system.

The project organization consisted of a steering group supported by a sounding board and a project quality group. The steering group was responsible for the end result and consisted of senior users, senior developers, a representative of the user organization, a project advisor and the project manager. The sounding board was responsible for the definition of the requirements of the user organization and the acceptation of business products. This group consisted of managers and staff employees of the user organization, one end user, a quality advisor and development manager. It was agreed that members of the sounding board informed the employees they represent. The project quality group was responsible to monitor the quality aspects of the project and the deliveries. Members were quality advisors and domain experts. The overall responsibility of the project manager was to assure that the project delivers the right products within the appointments that have been made.

In 2007 the WFM system was nationally deployed along all establishments of the Dutch social insurance organization. During the implementation phase at all locations, new releases of the WFM system were developed. To set priorities for the releases a user group was installed with members of the different function groups of the user organization. Priorities were discussed with members of the design team. Users could send issues to the user group and received information about its progress. In this phase the users were actually confronted with the new system for the first time. From the start it was planned that the use of the new WFM system was mandatory. During the introduction users received professional training lasting one to two days. After that, training on the job was supported by a trainer and a mentor. In the beginning it occurred that the new system sometimes failed. Besides that, during that period there was a huge workload because of new legislation. Also, there was significant time pressure to reach productivity norms. In some cases, users were allowed to use the old systems if the new system failed – or if it was easier to achieve the production norms.

This case context should be explicitly taken into account, as the survey that is reported in this paper took place 6 to 12 months after the deployment of WFM system. The specific conditions as just described were therefore incorporated in the development of the conceptual model from which expectations about the interrelation between this new WFM system and users' quality of work and their role as user participation is derived.

3 A CONCEPTUAL MODEL OF USER PARTICIPATION, USER SATISFACTION AND QUALITY OF WORK

3.1 The D&M model

There is an expanding field of research on the measurement and determinants IS/IT in organizations. Several theories and models from several perspectives have been developed in this domain. One stream of research departs from models on adoption and use of IS, with theories such as Diffusion of Innovations (DoI), Theory of Reasoned Action (TRA), the Technology Acceptance Model (TAM), Social Exchange Theory, Theory of Planned Behaviour (TPB) and Task Technology Fit (cf. Van de Wijngaert et al. 2008, Dwivedi 2008). The major stream of research however, is dedicated at exploring the direct determinants and measurements of success (or failure) of IS. Important studies in this area are Delone and Mclean (1992, 2003), Seddon et al. (1999), Smithson and Hirschheim (1998), Grover et al. (1996) and Sauer (1993). For the study reported in this paper, the departure point is the leading, and probably most-cited, model in the research of IS success, namely the updated DeLone and McLean Model of IS Success (see Figure 1).

The original D&M Model was first formulated in 1992 (DeLone and McLean 1992) and updated in 2003 (DeLone and Mclean 2003). In the updated D&M Model the quality of a system depends on three dimensions namely 'information quality' (e.g. completeness, ease of understanding, relevance), 'system quality' (e.g. usability, availability, reliability) and 'service quality' (e.g. empathy, responsiveness). Each dimension will affect 'use' or 'intention to use', and 'user satisfaction'. 'Use' is a behaviour, whereas 'Intention to use' is an attitude. 'Use' and 'user satisfaction' are interrelated. If there is a positive experience with 'use', this will lead to greater 'user satisfaction'. Similarly, increased 'user satisfaction' will lead to increased 'intention to use' and thus 'use'. As a result of this 'use' and 'user satisfaction', certain 'net benefits' will occur. The 'net benefits' can be individual or

organizational. The 'net benefits' will in turn influence, positive or negative, 'intention to use' and 'user satisfaction'.

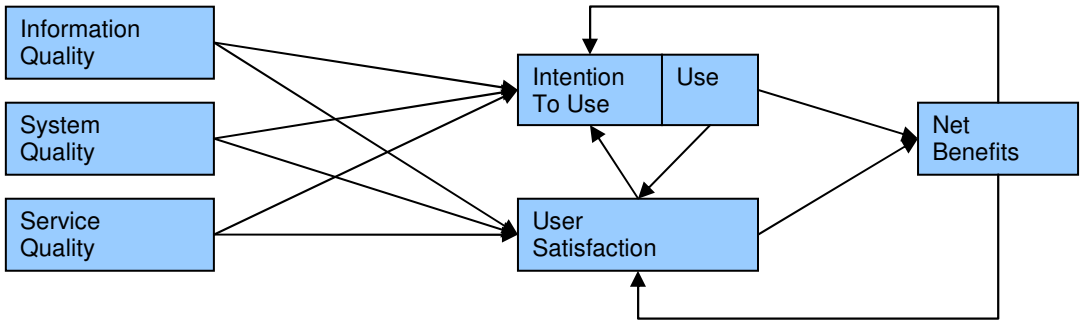

Figure 1. The DeLone and McLean IS Success Model.

Concerning the case context of the study as described in the previous section, the D&M model was adapted in two ways. First there is focus on system quality only, excluding information quality and service quality as other drivers for intention to use and user satisfaction. The reason for this is that interest for the research reported here lies in the evaluation of the deployment of a specific application (a WFM system), and a definition of the perceived quality of work of users as the net benefits. As was mentioned in the previous section, during the introduction users were for the first time confronted with the WFM system. System quality is therefore the most significant reason for (potential) changes in use, user satisfaction and their effects. Although use was mandatory, during the deployment there were several reasons to escape from this rule, e.g. system failure and production norms. The second adaptation was therefore to adjust the D&M model by selecting intention to use, not use, that is both related to user satisfaction and also to net benefits. Because this was a study of the deployment of a new WFM system that was not fully in use at the moment of data collection, its actual use is a less valid measurement since this depends on many other practical factors such as technical implementation problems and other delays. Therefore, the original D&M model that assumes that intention to use leads to actual use, with feedback effects from actual use to user satisfaction and intention to use was not used.

3.2 Extending the D&M model with Hartwick and Barki

It would be prudent to refer to the very early notion of Conway (1968), or more prominently Orlikowski (1992) that an important issue to the use and success of IS/IT is in the interaction between designers and users. In the study reported here the process between designer and user was explicitly included, and the D&M Model was extended by bringing in the concepts of user participation and user involvement. Recalling the case context, this is relevant as during the process of deployment of the WFM system users could bring in issues for new releases through user participation by delegation.

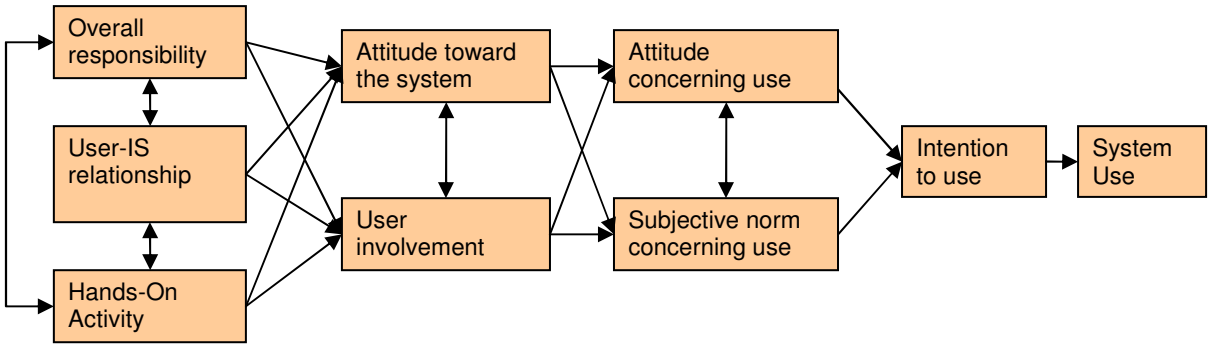

Figure 2. The Hartwick and Barki model of participation, involvement and system use.

One of the first models concerning user participation and user involvement was developed by Hartwick and Barki (1994). Their central model, theoretically developed and validated through longitudinal survey research among 105 members of the Canadian Information Processing Society that

recently were confronted with the deployment of a "new, business oriented, IS application in the near future" (p. 446) in their organization, is shown in Figure 2.

They define user participation as the observable behaviour of system users in the information system development process, i.e. their participation in information system development and implementation activities. Barki and Hartwick (1994) identified three dimensions of user participation: overall responsibility, user-IS relationship and hands-on activity. Overall responsibility refers to user activities and assignments reflecting overall leadership or accountability for system development project. User-IS relationship refers to development activities reflecting user-IS communication and influence. Hands-on activity refers to specific physical design and implementation tasks performed by users. Next, user involvement is defined as a psychological state of system users, i.e. as the importance and personal relevance of a system to use (Barki and Hartwick 1989). The authors differentiate this psychological state from another psychological state, namely attitude. This is generally conceptualized as an affective or evaluative judgment of some artefact and can be measured to locate one's position on a bipolar affective or evaluative dimension, e.g. bad/good. Finally, they incorporated in their model Fishbein and Ajzen's Theory of Reasoned Action (1975). From their study (Hartwick and Barki 1994), it is claimed that user participation influences user involvement and that the effect of user participation on intentions and use is mediated by the psychological constructs of involvement, attitude, and subjective norm. User participation and involvement are particularly important for the voluntary users of a system.

For this study the Hartwick and Barki (1994) model is used in particular the three user participation concepts and their relationship with IS success, i.e. intention to use, user satisfaction, and quality of work (as perceived by the end-users). The TRA concepts and actual use concept from their model is not used. As described previously, external factors in this case organization strongly hindered the actual use of the system during the WFM deployment. This makes the TRA constructs (attitude concerning use and subjective norm concerning use) as well as the actual use concept less relevant as concept to be included in our conceptual model.

3.3 Extending the D&M model with Kappelman and McLean

While Hartwick and Barki (1994) relate user participation to the Delone and McLean concept of intention to use, Kappelman and McLean (1991) shows that there is also a relation between user participation and user satisfaction. As stated before, the case context in the study reported here concerns a period where participation and involvement is critical. Therefore it is also important to link user participation to the concept of user satisfaction of the D&M IS Success model. The model that Kappelman and McLean (1991) tested is called the Behavioural-Attitudinal Model and is depicted in Figure 3. The study was conducted at 52 branches of a regional interstate bank holding company, during the installation and conversion of the information processing sub-system at each of the branches. Although the operationalization of user participation was not the same as Barki and Hartwick, the underlying items were based on the same literature (Olson and Ives 1980, 1982).

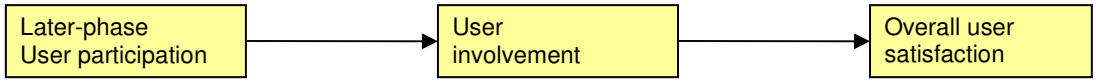

Figure 3. The Kappelman and McLean Behavioral Attitudinal Model.

As in the case reported in this paper users in the Kappelman and McLean (1991) study participated only in the system installation and conversion phase, or what they label as 'later-phase user participation'. This concept corresponds with the 'hand-on activity' dimension of Barki and Hartwick (1994). User involvement in the model of Kappelman and McLean also overlaps with the model of Barki and Hartwick (1994). Finally we adopted the concept of user satisfaction. Kappelman and McLean (date) convincingly showed that user participation does induce user involvement, i.e. that involvement actually intervenes in the participation-satisfaction relationship. Further, they argued that involvement is more important in understanding user satisfaction than user participation.

3.4 A conceptual model of user participation, user satisfaction and quality of work

The results of the adaptation and extension of the D&M IS Success model are combined and jointly depicted in Figure 4 below. In addition to the previous sub-sections, a number of other decisions were taken in designing the final conceptual model to suit the case study context.

To measure user participation, the concept of 'overall responsibility' was replaced by the concept of 'degree of influence'. As will be described in the next section, the actual measurement was how satisfied users were with the degree of influence offered by the sounding board and user group Further, user satisfaction is measured with the User Information Satisfaction (UIS) instrument as used by Shaw et al. (2002). With this instrument the perceived service satisfaction and information satisfaction is measured, because this is relevant in view of the D&M IS Success model. The net benefits in this study are defined as the quality of work of the WFM system users. As mentioned in the introduction, WFM systems are designed to coordinate processes and can potentially make work more efficient by improved information and steering of tasks and roles. WFM systems potentially effect the autonomy and workload of users, as well the information they receive. Therefore, it was decided to specifically focus on autonomy, workload and information as the main indicators of the quality of work of the WFM users. Further elaboration of measurements are presented in the next section.

The conceptual model in Figure 4 below depicts the expected relationships. From left to right, between: (1) the three user participation concepts on the one hand, and the three concepts system quality, attitude toward the system and user involvement on the other, (2) subsequently between these three concepts and intention to use and user satisfaction, and (3) between intention to use, user satisfaction and net benefits of the WFM deployment being the three dimensions of quality of work. By colours, Figure 4 also depicts the theoretical origins of the concepts and their interrelationships.

The main hypotheses from our conceptual model that will be tested are:

(1) user participation is positively related with system quality, attitude toward the system and user involvement;

(2) system quality, attitude toward the system and user involvement are positively related with intention to use and user satisfaction;

(3) intention to use and user satisfaction are positively related to net benefits.

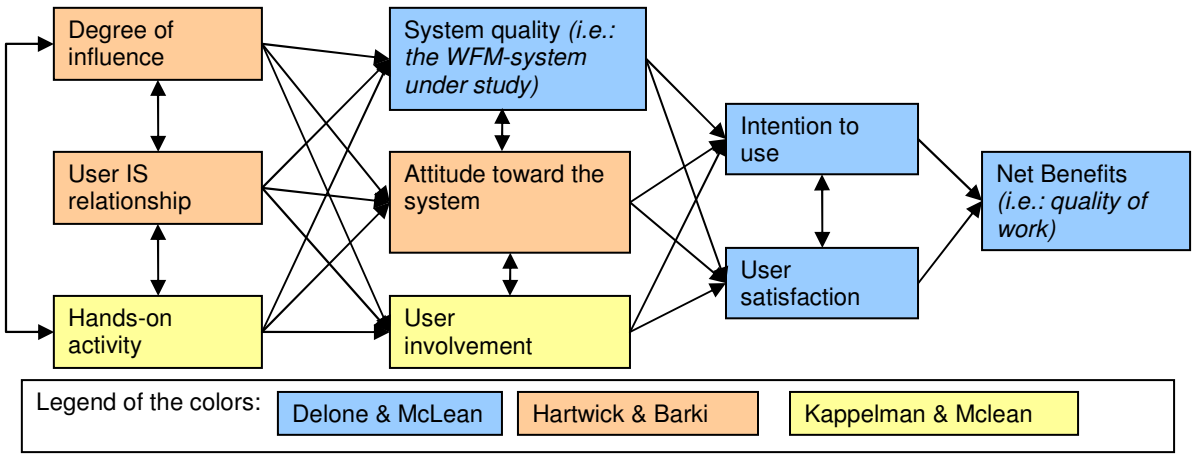

Figure 4. The conceptual model for this study.

4 THE SURVEY AMONG THE WFM SYSTEM USERS

The survey research took place at six offices of the Social Medical Function (SMF) domain and was conducted in May and June 2008. The focus of this domain is to examine the medical- and work

capabilities and to judge the claims of the clients within the scope of national laws. Within the SMF-domain over 7,000 UWV employees are active. Within these locations, the sampling was stratified according to the four main job categories that would jointly become team members as main users of the system. The job categories included team support employees, process support employees, work/job consultants and insurance medical doctors.

The (web-)questionnaire was sent out through internet. As not all team support employees and process support employees had access to the internet some completed the questionnaire from another computer or a hardcopy. A total 143 employees returned a complete questionnaire. The response rate was 30%, not biased according to job category as the main stratification criteria. The sample consisted of 13% team support employees, 21% process support employees, 42% job consultants and 24% medical insurance doctors – which is largely representative for the total organization. With regard to some other background characteristics, the sample can be described as:

- 60% male, 40% female;
- average age is 48.5 years;
- 27.3 percent of the respondents has an university degree;
- respondents have 19 years average work experience at the organization;
- 35 percent stated that they have more than average computing skills, compared to their colleagues.

4.1 Measurements

Below the measurements of the elements of the conceptual model (Figure 4) is described from right to left. The results of construct validity and reliability testing is presented.

Perceived Net benefits (i.e. Quality of Work) – As explained in section 3.4. the focus is on the three main characteristics from the total quality of work concept that are most relevant in relation to the potential effects of the WFM system under study, i.e. Workload, Information of Work, and Autonomy. The characteristics were measured with scales developed by Schouteten and Benders (2004) and Dhondt et al. (2002). Principle Component Analysis (PCA) shows that the 11 items for workload all contribute to a 1-factor solution with an eigenvalue of 5.58. Similar results were achieved for the 6 items for information of work (eigenvalue 2.87), and the 9 items for autonomy (eigenvalue 4.04). The overall accounted variance of the three 1-factor solutions was 50.8%, 47.8% and 44.9% respectively. In addition, Cronbach's alphas were calculated for the three item sets. Their scale reliability was confirmed as the Cronbach alphas were 0.90, 0.77 and 0.84 for the Workload, Information of Work and Autonomy constructs.

User Satisfaction – To measure user satisfaction the Information Satisfaction and Service Satisfaction scales developed by Shaw et al. (2002) was used. Factor analysis was performed to analyze the construct validity of the group of 9 items. PCA resulted into a 1-factor solution with an eigenvalue of 4.50, accounting for 50.0% of the overall variance. Reliability of this User Satisfaction scale was confirmed by a Cronbach's alpha of 0.87.

Intention to Use – The 'intention to use' concept can be defined by one relatively clear item, i.e. "If the system was not mandatory, I would still use it", as suggested by Seddon and Kiew (1996) as one of the first scholars with regard to this issue. This single item holds 4 answer scale categories, as most of the other items used for the model.

System Quality – For the purpose of this study, specifically the aspects Usability and Usefulness of DeLone and McLean's concept of system quality are measured. Usability is measured by 6 items from a (Dutch) questionnaire developed by Tijdens and Steijn (2002) and the classic complexity scale of Thompson (1991). Usefulness is measured by 6 items from the classic compatibility scale of Moore and Benbasat (1991) and the work-with-computer-scale from Tijdens and Steijn (2002). Factor analysis was performed to analyze the construct validity of the total set of 12 items. The one-factor solution from PCA holds an eigenvalue of 6.43, accounting for 53.6% of the overall variance. Reliability analysis confirmed the scalability of the 12 items, as Cronbach's alpha is 0.91.

Attitude towards the System – Attitude toward the system is measured by four items from a scale developed by Hartwick and Barki (1994). Different from the previous items described, they developed as 7-point items by which users could judge the IS/IT application by contrasting labels as "good/bad", "terrible/terrific", "useful/useless" and "worthless/valuable". PCA showed that the four items clearly load on one factor, with an eigenvalue of 3.21 and an overall variance of 80.2%. As can be expected, the reliability of the scale was also confirmed by a Cronbach's alpha of 0.92.

User Involvement – To measure User Involvement, five items from Hartwick and Barki (1994) were used. They defined the User Involvement concept by items that express the judgment of the IS/IT application in terms of "important/not important", "relevant/irrelevant", "fundamental/trivial", "essential/non essential" and "significant/insignificant" on a 7-point scale. For this dataset, PCA on the items showed that there is one strong latent factor (eigenvalue was 3.36, overall variance 67.3%). Reliability analysis supported the scalability of the item set (Cronbach's alpha = 0.88).

User-IS relationship – The User-IS relationship scale, as part of the User Participation concept, is based on the work of Hartwick and Barki (1994) as well. They developed 7 items to measure 7 different types of participation that could be either scored as "no" or "yes". As these items refer to specific actions that, in many cases, were actually not applied in IS/IT project (for all kinds of reasons), it was decided to sum the "yes" scores of these items instead of applying PCA and reliability analysis which is more appropriate for 'subjective' items as opinions and Likert-type statements.

Hands-on Activity – Hands-on Activity concerns a scale that is comparable with the User-IS relationship scale, also developed by Hartwick and Barki (1994). Likewise, the sum of the 8 items they defined was used, addressing 8 different types of hands-on activities to let users participate in the IS/IT development.

Degree of influence – Finally, the Degree of influence as developed by Lynch and Gregor (2004) was applied. Using their four (4-point) items, PCA on the dataset confirmed that these items can be aggregated into one latent factor, with an eigenvalue of 2.67 and overall variance of the 1-factor solution of 66.6%. Reliability analysis confirmed the scalability of these four items: Cronbach's alpha is 0.83.

5 RESULTS

In Figure 5 below the results of three OLS regression analyses that correspondent with the three decomposed parts of the conceptual model is presented. These are labelled as 'Model I', 'Model II' and 'Model III'. The one-way-directed arrows in the figure represent the significant (standardized) regression (beta) coefficients ($p<.01$), while the two-way-directed arrows represent the significant correlations ($p<.01$) between the independent variables within the subsequent regression models. For all three OLS regression models, the potential problem of multicollinearity was investigated by computing VIF-factors for each predictor in the regression model. Although in some cases correlations between independent variables were relatively high, VIF factors in none of the three models exceeded 5 – a commonly applied rule of thumb.

The results from regression Model I show that primarily *User Satisfaction* holds a significant relationship with each of the three *Quality of Work* dimensions. Although *Intention to Use* is strongly correlated with *User Satisfaction*, this holds no significant relation with the users' *Quality of Work*. This might be partly due to the problems with the actual use of the WFM system at the social insurance organization as we described in section two. On the other hand, this result also supports that satisfaction through 'actual use' is an important determinant. It is confirmed that satisfied users significantly experience higher *Autonomy*, *Work-related Information* and less *Workload*. The explained variance (adjusted R^2) of the three regression models is 7.4% ($F=6.613$, $df=141$, $p=.002$), 16.4% ($F=14.802$, $df=141$, $p=.000$) and 15.0% ($F=13.424$, $df=141$, $p=.000$) respectively.

With regard to model II, the three assumed determinants of *User Satisfaction* and *Intention to Use* are strongly inter-correlated. In joint regression analysis however, only *System Quality* holds a significant relation with *Intention to Use* and *User Satisfaction*. Apparently, the usability and usefulness of the WFM system dominates the actual satisfaction and intention to use of the users at the social insurance,

while their attitude and involvement only supports this, i.e. not significantly driving it. Given the context as described earlier – a new WFM system fully in the phase of adaptation and deployment, combined with limited use of the WFM system – this result is as expected. The explained variance of both regression models (adjusted R^2) is relatively high: 47.8% (F=11.976, df=142, p=.000) for *Intention to Use*, and 45.0% (F=37.843, df=142, p=.000) for *User Satisfaction* as a dependent variable.

Model III finally, shows that *Degree of Influence* is the prominent determinant of *User Involvement*, *Attitude towards the System* and *System Quality*. Again, the three predicators of Model III do correlate and clearly coincide, but 'in competition' the perceived *Degree of Influence* is the clearest driver, probably as the participation items of *Hands-on Activity* and *User IS relationship* were lacking in practice as well. The explained variance of the three regression model varies: 23.5% (F=15.580, df=142, p=.000) for *System Quality* as a dependent variable, 23.4% (F=15.445, df=142, p=.000) for *Attitude towards the System*, and 10% (F=12.660, df=142, p=.000) for *User Involvement*.

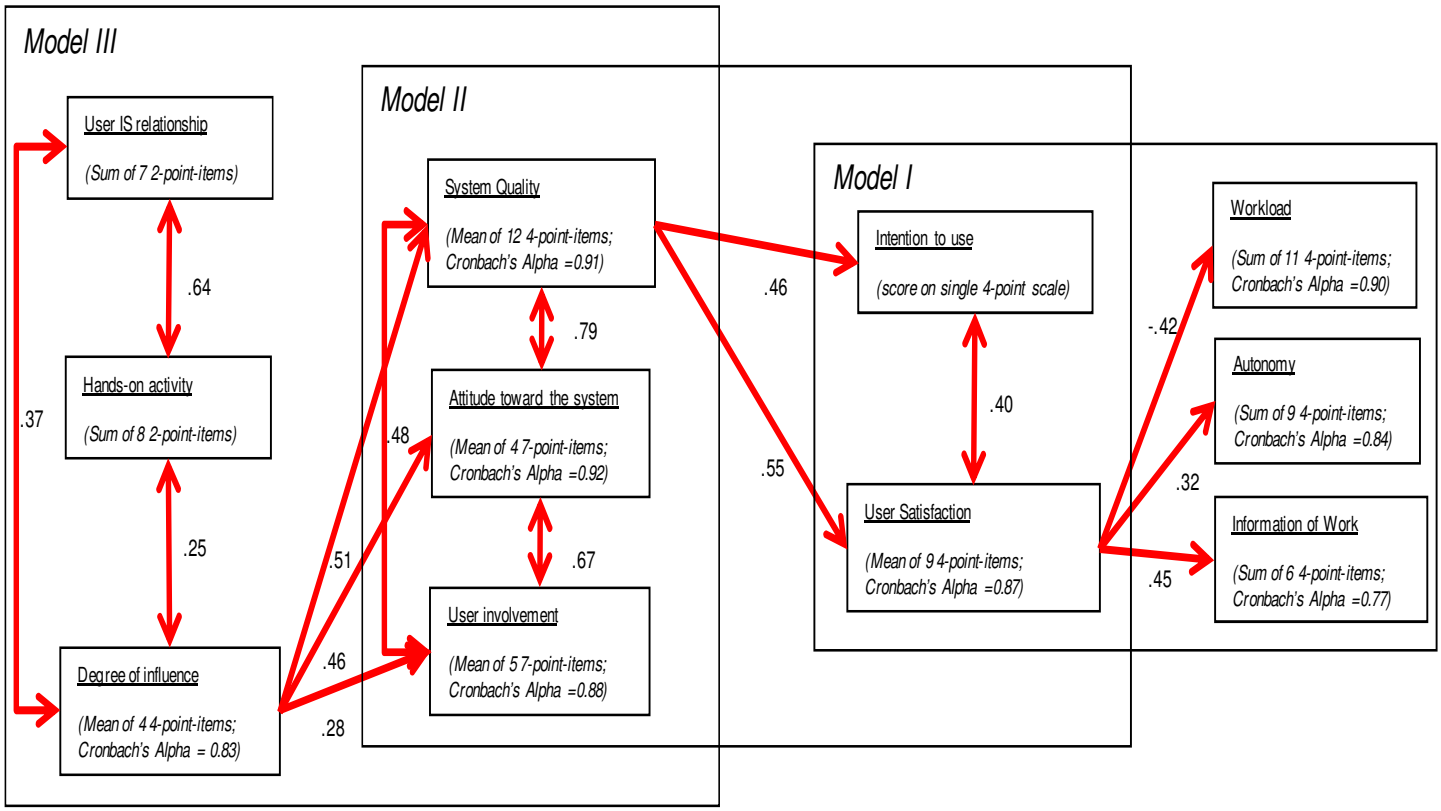

Figure 5. *The conceptual model tested: reliability of the item scales (stats within the boxes), significant correlation coefficients (two-way arrows between the boxes), and significant standardized regression coefficients (one-way arrows between the boxes) for three sets of dependent variables.*

6 CONCLUSION AND FURTHER RESEARCH

This paper presents and effort to build upon two research traditions that both deal with the question of how the success of IS/IT deployment can be understood in terms of individuals benefits, more specifically the users' quality of work. In developing a conceptual model, different models and concepts from the IS-tradition were brought together (i.e. the model IS success model of DeLone & McLean, extended by model elements from Hartwick & Barki, and Kappelman & McLean). In addition, concepts from the social science tradition on quality of work and its relevant dimensions in relation to IS use, more specifically WFM systems were used.

Based on the context of a large Dutch social insurance organization that recently deployed a new WFM system for all their employees, a conceptual model was customized. In this model it is claimed that the quality of work of users is directly related to their intention to use the WFM system and their user satisfaction. Next, it was hypothesised that these two concepts in turn are related to the quality of the (WFM) system, the users' attitude and their user involvement. Finally, the three types of user participation are included into the model as drivers of the perceived system quality, system attitude and user involvement.

Data collected from a survey among 143 users within the case study organization enabled the construction of valid and reliable measurements and constructs as defined in the conceptual model. Correlation and regression analysis showed that for each of the three sub-models significant relations were found, although not all of the hypothesized relationships were confirmed. It was shown that (1) the degree of influence is a key determinant for the perceived quality of the system, (2) perceived system quality is a main driver for user satisfaction, and (3) user satisfaction is a main determinant of the users' perceived quality of work. From these results it could be argued that the concept of (perceived) system quality appear to play a central role. On the one hand, system quality is the main determinant of user satisfaction which subsequently holds the strongest relation with the users' quality of work. On the other hand, system quality is as strongly related to user participation as user involvement. One way to further validate our findings is to estimate the complete model using Structural Equation Modeling (SEM). An additional method to validate our scale construction is to apply factor analyses over all items.

If these (quantitative) results are interpreted against the (qualitative) case context as described earlier in this paper, some further conclusions can be drawn. While the value of the WFM system within the Dutch social insurance organization is recognized, its importance for all processes and tasks has not been proven yet. The disruptions during the introduction of the WFM system caused employees to kept working with the old system to keep up with their targets. This resulted into a lack of use and experience with the new system. Although the benefits and added value of the new system still remain unproven, it can be seen from the survey results that user satisfaction and system quality do matter. *If* users increasingly value the quality of the new WFM system, their satisfaction and perceived quality of work will increase – and most likely their productivity.

With regard to participation and involvement, it was determined that users at the Dutch social insurance organization were not much directly activated during the deployment of the WFM system. Instead, their participation was mainly organized through delegation, and in addition users were frequently informed during the project. From the analysis it was found that *if* users experience this degree of influence, this holds a positive relation with the experienced quality of the system, user involvement and attitude towards the system. As this subsequently increases the users' satisfaction and quality of work, this influence can thus be considered as an important 'background driver' for the benefits of the new WFM system. These results support the basic statement that employees should play an active role in WFM projects (Küng 2000). High impact IS/IT application as WFM can indeed upgrade jobs, but only if this is mediated with user participation.

The measurements and analysis of user participation in the context of this case of WFM at a large Dutch social insurance organization also provides new roads and ideas for further research. In particular, finding the 'right' type of user participation for the 'right' type of user/system combination can be a crucial new research question. It was found that 'indirect' ways of participation hold positive relations with user involvement and perceived system quality, while direct participation activities showed no relation with these factors. This is a particularly interesting result for larger organizations. Obviously, with larger number of users the costs of user participation will be higher too, challenging new and 'efficient' ways to let users participate during deployment projects. Further research within other organizations is needed to validate if the size of the organization is indeed an important condition for selecting the 'optimal' type of user participation (cf. Markus and Mao 2004, Nordheim and Nielsen 2008). Finding the right mix of user participation makes it possible that users go with the (new) workflow, and subsequently experience an improvement of their quality of work as well.

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